US Pat Appln Nr 10/043,284 Docket 630-24US (CIP)

REMARKS,
as submitted in response to O/A dated 03 June 2003

1. The rejection under 35 USC 112 is addressed by the amendments.

2. The changes to claim 2 add more detail to the definition of coining, and emphasise that the coining force is a force that is applied to the shoulders, and not necessarily to the tube as a whole.

New claim 14, now added, changes the generic expression "shoulder" of claim 2 to the narrower term "ring-bead", which is the major focus of the invention.

3. The PTO rejects claim 2 under 35 USC 103. The PTO position is that the features recited in claim 2 that are not present in Dudash are present in Leitch, and it would be obvious to modify Dudash by adding the features from Leitch. We request that this position be reviewed.

The Dudash reference shows headrest-tubes attached into the top rail of a seatframe. The invention is aimed at providing a system for attaching headrest-tubes that out-performs the system disclosed by Dudash, but at no *extra cost*.

4. Certainly, the expert would find it obvious to provide and use press tools (punches and dies), in order to make ring-beads on headrest guide-tubes of the kind as disclosed by Dudash. However, when considering the patentability of claim 2, the question is: would the expert find it obvious to coin the ring-beads onto the seatframe?

The PTO rejection is based on its position that coining is disclosed in the Leitch reference. We submit that this is incorrect, for the following reasons.

5. The amendments to claim 2 give further definition as to what coining means in the present invention.

Claim 2 refers to a tube-collapsing-force, and (now) to a shoulder-coining-force. When it comes to forming ring-beads by compressing a tube in a press, obviously the press is going to exert a tube-collapsing-force. That is to say: all die-sets in which ring-beads are formed are die-sets that apply a tube-collapsing force; it is inevitable that the press and dies must have been arranged to exert an axial tube-collapsing force; ring-beads cannot be made without collapsing the tube axially.

But it is not at all inevitable that the die-set must have been arranged to coin the ring-beads, i.e to squeeze the ring-beads flat with a very heavy force, as a final stage, after the ring-beads have been formed. The designer has to design the die-set specially to do that.

It is necessary to consider what happens at the end of the press stroke:-
- has the designer arranged for the punches to bottom together, thereby providing a limit to the magnitude of the forces that the press can apply to the ring-beads?
- or, has the designer arranged for the punches not to bottom together, whereby the press force is available for squeezing (coining) the ring beads flat?

Note paragraph [0049] of our disclosure: *The surfaces, one on top of another, lie in series and form a stack. The dies are arranged so that the compressive force delivered by the dies is applied to that stack. The designer should see to it that nothing else in the dies bottoms, in such manner as to prevent the full force with which the dies are brought together from being applied to the stack of surfaces.*

6. Nothing in Leicht indicates that the punches and dies have been designed to provide coining. On the contrary: Leicht's punches are shown bottoming against each other - which is a condition that negates coining.

Consider the arrangement as shown e.g in Leitch's Fig 7: if the press force is now increased, the upper and lower punches will be pressed together all the more forcefully - but there will be no increase in the force applied to the beads.

In detail, the situation in Fig 7 is as follows:-
- the spacer 70, being urged downwards by the rod 68, is prevented from moving downwards by the abutment of its shoulder against the upper die 76;
- the upper die 76 in turn is prevented from moving downwards, because it is in contact with the ring 52;
- the lower die 56, being urged upwards by the rod 60, is prevented from moving upwards by the abutment of its shoulder against the ring 52.

In other words, in Leitch's Fig 7, the punches have bottomed out. This being so, no matter how hard the rods 60,68 are pressed together, no further force will be experienced by the ring-beads 36,38. Therefore, the arrangement of the die-set in Leitch is such as will prevent a coining force from being applied to the ring-beads.

Looking at Dudash, it is immediately clear, from the briefest perusal of Figs 8,9, that Dudash's ring-beads have not been coined flat. While it is perhaps not quite so immediately clear in Leitch, the expert will quickly understand that Leitch's ring-beads also have not been coined flat.

7. In our claim 2, the punches do not bottom together. When the punches

are applied to the ring-beads, the whole force of the press is available to crush and flatten (i.e to coin) the ring-beads together. The point is clearly recited in (amended) claim 2, and the point is clearly explained and illustrated in the text and drawings of the specification.

As explained, if the ring-beads are not coined, the headrest guide-tubes might work loose. As described, with coining it is possible to achieve (almost) complete freedom from in-service loosening. (Previously, only welding could guarantee that - and welding has its own problems).

8. Some other points about Leitch should be made.

Of course, Leitch shows teeth. Is it the PTO view that the expert would ignore the teeth, when applying the teachings of Leitch?

In the pulley product of Leitch, the surfaces against which the formed edges of the teeth abut is a vertical surface; so, after being sheared vertically, the formed edges can be left pressing resiliently horizontally against those surfaces. Fig 5 clearly shows that Leitch's teeth are <u>not</u> flattened down. But if Leitch's teeth were to be squeezed flat vertically (i.e coined), that horizontal resilience would disappear. Therefore, in Leitch, coining the teeth would destroy their resilience, which might well cause them to work loose. Thus, coining the teeth would be contra-indicated, in Leitch - which goes against the PTO position that Leitch serves as a teaching reference in favour of coining.

We note also that the skilled expert really would not contemplate coining a very large diameter - such as the hub of Leitch's pulley. It is only because headrest-tubes are so small that coining forces are within reasonable bounds. The larger the tube, the more unlikely it is that coining will be done. Also, headrest-tubes are thick-walled, which means that coining actually makes a meaningful difference to the final form of the tube -- in the case of a thin-walled tube, whether the thin-walled tube is formed by the usual collapsing /bending techniques in a press, as distinct from coining, the shape of the thin-walled tube tends to be exactly the same. So, it is mainly when the tube is thick-walled, but small in diameter, that coining tends to be so useful as a way of finalising the exact final form of the ring-beads. The expert would not look at Leitch with any notion that the pulley would be a good candidate for coining.

We might also note that, if Leitch were coining the ring beads, they would grip so tightly that he would not need the teeth. The fact that teeth have been provided is another indication (if such were needed) that Leitch is not coining.

9. Given that Leitch does not coin the ring-beads in his pulley, the PTO view that Leitch teaches coining the ring-beads of Dudash's headrest-tubes

must fall.

10. We emphasise the point that our die-set is so designed that the upper and lower punches do not bottom together. Our Fig 4 and our Fig 12c show this particularly. We have designed our punches so that the punches are still not bottomed together at the time when the punches close on the ring-beads. The dies do not bottom together against themselves, or onto some solid part of the work. The dies are able to exert a final, very heavy, force on the ring-beads, beyond merely collapsing and buckling the metal.

We make the point, as above, that where a designer arranges for the punches to bottom together, there can be no coining of the ring-beads. This point needs some qualification. Of course, if a real press is designed for coining, it might happen (e.g if there were no workpiece present) that the punches would indeed bottom together. For the purposes of the invention, the point is that the punches are so arranged that a heavy coining force can be applied to the ring-beads before the punches bottom out. When the workpiece is properly present, and the ring-beads are properly in place, it may be regarded that the punches do not bottom out onto each other, but rather that the punches bottom out onto the ring-beads.

11. The references to vertical, upper, lower, etc as used in the claims and specification, should not be construed in an orientationally-limiting sense. The words should be applied to a structure as represented on paper, and the paper is so oriented that the words can be consistently applied.

12. We note that the subject matter of claims 5,6,8,9,13 is considered allowable. However, for the above reasons, we believe claim 2 is allowable (and claim 14), and we look forward now to receiving a Notice of Allowance.

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